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(54) Transmitting postcode data for alerts

(57) Postcode data is used to identify senders or receivers of messages. In a first version, a public alert system uses television or radio signals preceded by postcode data. Only those receivers having the required postcode can receive the data. In a second version, a telephone set is programmed with data indicating the postcode of its location. In an emergency call, activation of a specific button on the set transmits the postcode data to a receiving telephone, thus indicating the location of the emergency.

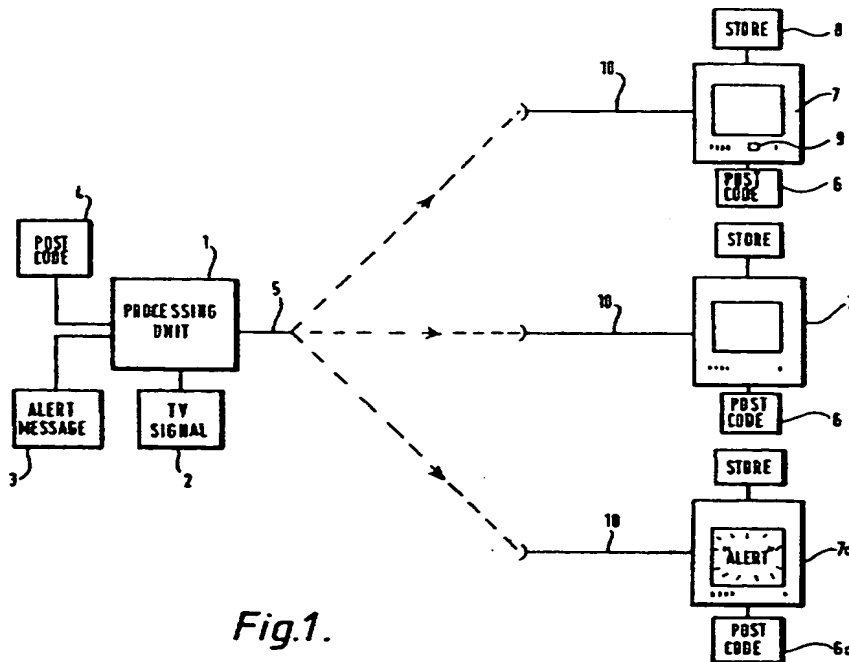


Fig.1.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

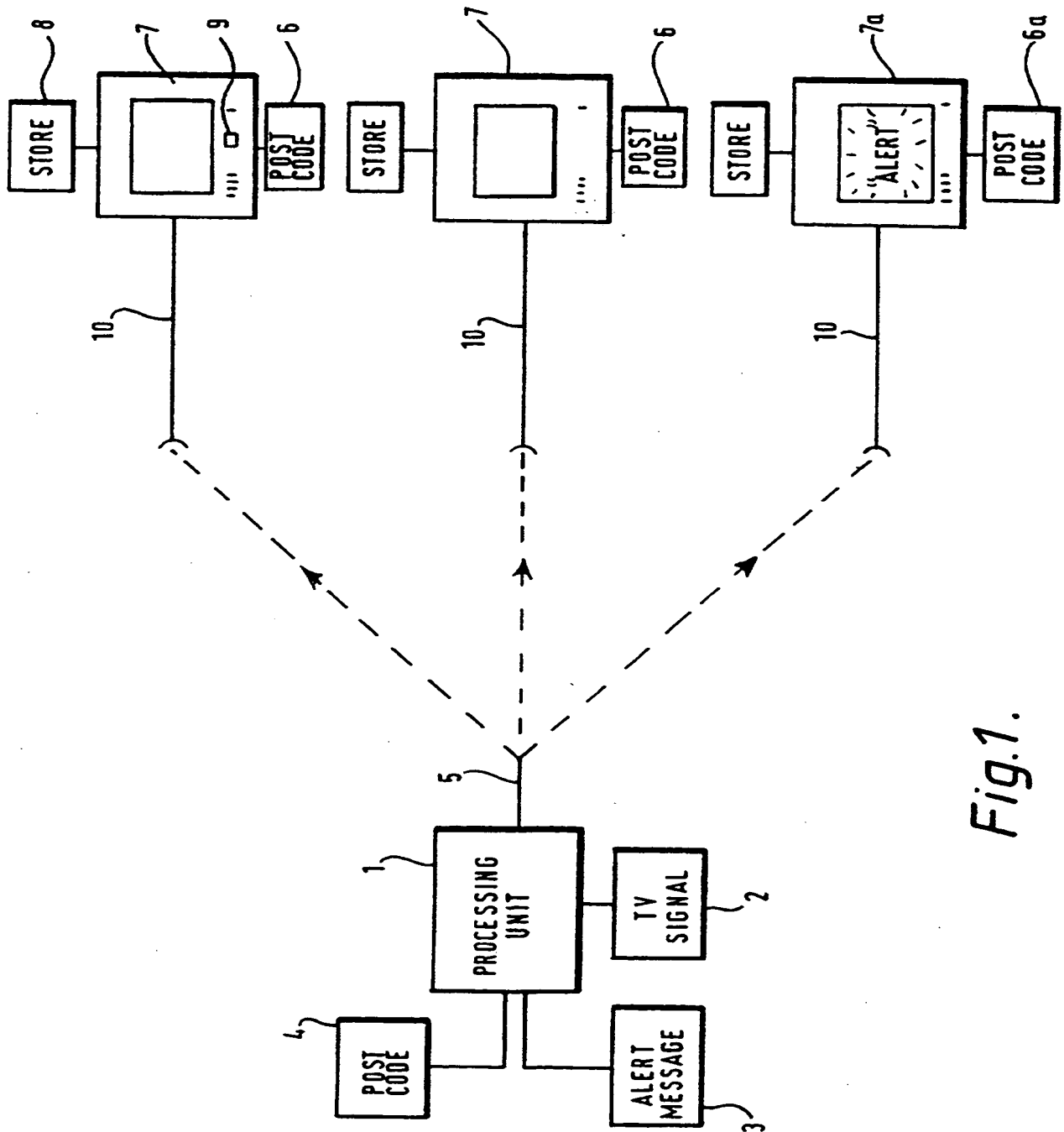


Fig.1.

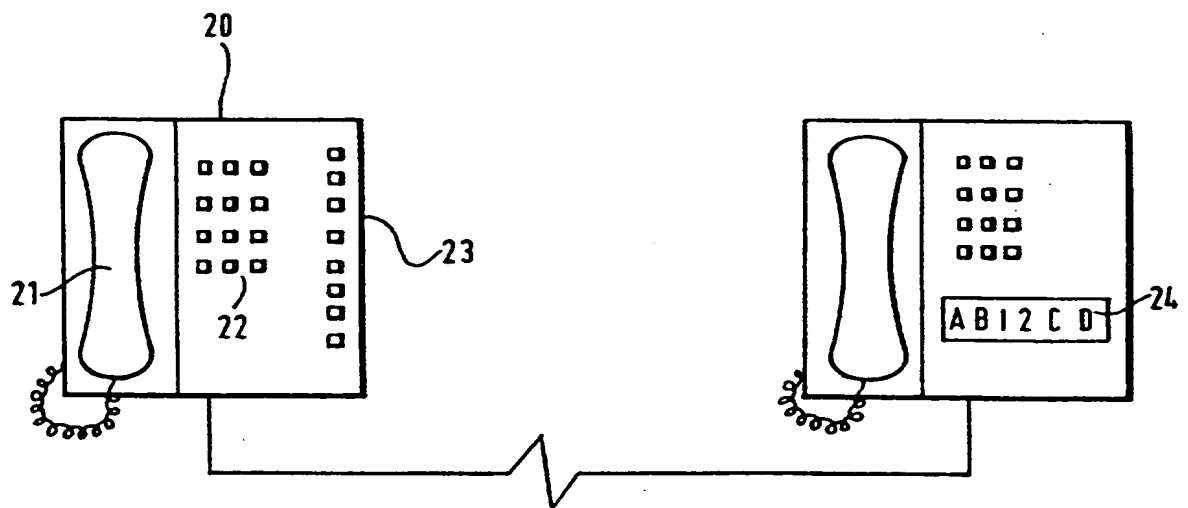


Fig.2.

SYSTEMS FOR TRANSMITTING INFORMATION AND ALERTS

This invention relates to systems for transmitting information and alerts. Particular, but not exclusively, it relates to systems for transmitting
5 information representative of the whereabouts of an individual for use in an emergency situation where the individual is contacting emergency services by telephone.

The invention also relates to a method for transmitting alerts, public service information or other
10 information which is intended for receipt either by a general population or by only selective individuals or groups within the population.

There is a requirement for a national alert system in any population. The alert system may be used to
15 alert the population of natural events such as flood warnings, hurricane warnings, or for use in war time. Up to a few years ago, there existed in the United Kingdom a nationwide siren system in which sirens in local areas could be activated to give required warnings. A simple
20 siren system, however, cannot indicate the precise nature of any event and also of course a siren is heard by everyone in its vicinity. There may often be occasions when it is not required that an entire population in a local or larger area be alerted to a situation. For
25 instance, in a medical emergency it may be useful to alert all doctors and other medical staff in a vicinity without alerting the remainder of the population. In a flood alert situation, it would be preferred to alert only those persons likely to be directly affected by the flood so as
30 not to panic people who are unlikely to be directly affected. This cannot be done with a conventional siren system.

There is therefore a requirement to be able to address alerts to selective persons only, typically to a
35 household or even to individuals within that household.

In the United Kingdom, virtually every household possess a television set and/or radio set. A convenient means for transmitting such selective alerts would therefore seems to be to use these. However, up to now,
5 no method has satisfactorily been proposed which enables the television or radio set in a house to be selectively addressed and provided with an alert.

According to the present invention in a first aspect, there is provided a method of electronically
10 transmitting data wherein postcode data is transmitted to locate or identify the sender or receiver of the transmitted data.

According to the present invention in a second aspect there is provided apparatus for transmitting and
15 receiving alert messages, comprising means for generating an alert message; means for associating the message with data representative of at least one postcode; means for applying the alert message and said data onto a television or radio signal; and a receiver means comprising means for
20 receiving the television or radio signal; means for comparing the or each postcode data transmitted with a postcode stored at the receiver and means for displaying and/or storing the alert message if a match is found.

The message and postcode data is preferably
25 transmitted as data in a non-viewed part of a television signal, such as the vertical blanking interval, or other appropriate portions, in a manner similar to that by which teletext and other data is currently transmitted.

Thus, each television or radio set in the area
30 capable of receiving the television or radio signal has, stored within it or in a separate unit associated with it, a representation of a postcode associated with the household and/or with one or more individuals resident in that household. At the transmitting station, the
35 postcodes only of those households or individuals it is

required for the message to be viewed by are transmitted with the coded alert message and so only those households receive the relevant message. Thus, in a flood warning situation, for example, where the houses in one road are at risk but those in an adjacent road are not at risk, by sending only the postcodes of those in the at-risk road, only those persons will view the message and the persons in the adjacent road which is not at risk will not view the message and will not therefore be unnecessarily alarmed.

The postcode (zipcode) is a combination of letters and numerals used by the postal authorities in the UK and many other countries, to identify either large individual addresses or groups of, from 1 to 100 addresses.

In the UK, the postcode consists of a combination of letters and numbers, such as AB1 2CD. The first part of this (AB1) is an outward postcode which enables mail to be sent to a correct local area for delivery and this part contains the area (AB) and the district (1) to which mail is to be delivered. The second part of the postcode (2CD) is the inward postcode and is generally used to sort mail at a local area delivery office. Each postcode may be unique to between 1 and 100 addresses. Although not usually quoted, an additional two characters are available which form a delivery point suffix. These would be a combination of numbers and letters and can be used to identify any particular address within the group of addresses identified by a particular main postcode. Examples of algorithms for converting postcodes to numeric data are described later in the specification. The structure of the postcode does mean, however, that various levels or persons can be accessed. By generating just the initial two letters AB, which represent a postal town such as, for example, WD indicating Watford, all dwellings in the WD area can be

accessed. On the other extreme, by generating a full
postcode plus a selected delivery point suffix, only one
particular household can be identified. This may be
extended to identify a particular person in a household or
5 dwelling.

The term 'postcode' as used herein encompasses
the use of any part of the full code (eg AB alone), or the
full code, or the code plus further information.

In a further modification, one or more yet
10 further digits may be added to the code and these are
representative of professions, such as doctors, nurses,
water board engineers, etc or hierarchy in an
organisation, or of other parameters so that persons can
be further addressed by profession, level of
15 responsibility or other criteria. Thus, in an emergency
in a particular location, all doctors, nurses and
paramedics living within a defined vicinity of a point of
emergency can be alerted.

At the receiving point, a television set may be
20 continually in a stand-by mode and may be switched on and
the message displayed when the apparatus is activated.
Alternatively, the alert message may be stored in a store
at or associated with the TV and a warning, such as a
visual or audible warning, be displayed on the television
25 set or an associated warning apparatus.

A second aspect of the present invention relates
to emergency situations when it is necessary for a person
to clearly indicate his whereabouts over the telephone to
another person. Typically, this occurs when a person
30 dials the emergency services requesting assistance. At
the present time, after a person dials 999 (the emergency
services number in the UK) he is asked for his location
which has to be dictated manually over the telephone. In
an emergency situation, a caller may not know exactly his
35 location, or may be too distressed to give it out clearly

or there may be too much noise or other interference. This can greatly hinder the emergency services in their attempts to arrive swiftly at the scene. Methods are available for tracing the origin of some telephone calls but these take time and are unsatisfactory.

According to the present invention in a third aspect there is provided apparatus for transmitting information representative of the location of a caller; comprising a telephone set; means for storing numerical tone data indicative of at least a postcode, the telephone number associated with the set and/or an address, and means for generating tone signals representative of the numerical data when a telephone button is pressed and for transmitting these on the telephone line and, means at a receiving telephone systems for receiving the tone signals, converting them into a representation of the postcode, number and/or address and displaying or otherwise indicating this.

The conversion back at the receiving telephone may be done at a computer or other apparatus linked to the telephone. The postcode may never actually be viewed but could be generated as an intermediate step by software or other means which generates address data.

Most telephone nowadays tend to have one or more memory (short code) buttons in which frequently dialled telephone numbers can be stored such that a depression of that button causes the number to be dialled. In a preferred embodiment of the invention, a numerical tone representation of a postcode where a telephone is located is stored as one of the numbers on one of the buttons. Thus, when a caller is talking to, for example, the emergency services, by depressing that button the numerical representation of the postcode is transmitted to the receiver. Receiving means at the receiver decodes this into the relevant postcode and displays the postcode

or uses it to generate an address. In emergency situations, all that is therefore required to indicate the location of a caller is to press the particular button and the location, in the form of a postcode or otherwise, will be indicated at the receiving end. The postcode can then be used, with the aid of a suitable database, to identify the location. Alternatively, software and databases are commonly available which can convert automatically from a postcode to a geographical address.

Similar to the previous aspect of the invention, a delivery point suffix can also be added to the stored and received postcodes such that a particular address can be identified or even a particular individual within that address.

In a modification, a numerical indication of a person's name, address, telephone number or other useful information may be stored on further memory buttons and transmitted at will by depression of that button.

In a further aspect of the invention, one or more of the above are stored instead of a postcode.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows schematically a system for transmitting over a wide area an alert message and for selectively receiving and displaying the message; and

Figure 2 shows a telephone system for transmitting postcode information.

Referring to Figure 1, a system for selective addressing using transmitted television signals is shown.

At a transmission station, a processing unit 1 receives a TV signal 2 to be transmitted on a particular channel. The processing unit also receives as an input a relevant alert message when appropriate. This may be generated using word processing or other suitable software

and may incorporate text, pictures or even voice or video information in some embodiments. This is produced on a message generator 3. When an alert message is to be sent by the system, the processing unit also receives details of the relevant postcodes from a postcode generator 4. As described above, various levels of postcode can be entered ranging from a simple one representative of a post town, through specific postcodes, down to specific postal delivery suffixes or even extra numerals indicating specific persons, professions, etc. These may be input manually or selected from a database by applying certain criteria to select entries from a database. Software is included in the postcode generator which converts each postcode into a numeral string. The processing unit adds the alert message and, at the front of the alert message, all the relevant postcode information onto the TV signal. This may be done in the same way, that, say, teletext or other information is applied to a vertical blanking interval or other portion of the TV signal. Means for doing this are well known. The composite signal is then fed to a transmitter aerial 5 and transmitted. It may also be fed, by land lines or microwave transmission for example, to remote stations for transmission.

Each of a plurality of receiving television sets is modified by circuitry which can select and display data from the vertical blanking interval or other portion of the TV screen. The TV set also includes, either within its circuitry or in a separate unit, details of the postcode or other unique data associated with that set. This includes a postcode store 6. Optionally, the TV set 7 may also have with it an associated memory store 8 which can store incoming alert messages. If a store 8 is provided then it is preferable to provide a display 9 or other visual or audible means associated with the television which is actuated when a message is stored in

the store to alert a user to view the message.

When the TV signal, with associated postcode and alert data, is received by each of the respective television sets, via their respective aerials 10, circuitry within each television set analyses the list of postcodes and, if a match is found between one of these and the postcode with which it is associated, then the message is viewed by the television set. The set may be arranged such that it is normally in a stand-by mode but is powered up to display a message automatically when a relevant message is received. Alternatively, or in addition, the message may be stored in the store and an appropriate warning given on display 9. In the example shown in Figure 1, three representative television sets are shown. Only the postcode associated with television set 7a is transmitted with the alert message and therefore the alert is only viewed and/or stored in set 7a. The other sets 7 ignore the message since no match is found with their postcode and therefore the message is not viewed. Thus, the message may be selectively addressed to only one or to a group of any size selected from the population who can receive the television signal. Many other modifications to the basic system of Figure 1 may be envisaged and are within the scope of the invention. Instead of television, the transmission medium may be radio signals. It is already known to transmit data, eg RDS data, with radio signals.

The postcode at each television set may be individually programmed into that set by the user. Alternatively, the set can be programmed when it is purchased. It can also be programmed by means of a system such as a smart card in which a card, bearing electronic circuitry or magnetic data for example, is issued to each individual or household and bears data representative of the postcode, perhaps also the profession of relevant

persons of that household and other relevant information. This can automatically be entered into the system via the card in conventional manner. It is, of course, advantageous that once programmed it is not easy to
5 inadvertently change the programming although modification will from time to time be necessary as persons move around and situations change.

For a wide scale application, more than one transmitting station may be linked, for example by land
10 lines, by microwave link, or by telecommunication facilities, to give out related same messages. It may be necessary for other communication to occur between these lines to effectively organise emergency planning. For war time situations, it may be necessary to duplicate
15 transmission paths and/or to take other steps such as placing transmission equipment underground, use of stand-by power supplies and providing direct access to individual transmitters for local emergency authorities in situations where the main network has been severed.
20 Desirably, the systems used on television and radio broadcasts are compatible so that if there is a general mains power failure, alert messages may still be transmitted by radio, which stands more chance of being received at portable battery powered appliances, albeit
25 with lower information capacity at the present state of development.

Figure 2 shows a further aspect of the present invention involving telephone communications. A telephone
20 is provided with the usual handset 21, array 22 of digit buttons 0 to 9, * and #, and a plurality of memory buttons 23. These are commonplace in modern telephone systems and, generally, a commonly used telephone number is stored in relation to a particular one of these memory buttons such that depression of that memory button causes
30 that telephone number to be dialled. In the present
35

invention, instead of a telephone number, one or more of the memory buttons 23 stores a numerical representation of a postcode in a form suitable for transmission by the form, eg data which can be interpreted to generate DTMF ("tone dialling") tones.

5 A telephone set at an emergency station, for example the emergency operator, is provided with means which can decode an incoming tone signal and restore the original postcode. This may then be displayed on a display 24 for example or could be used as an input to a computer software system which has a database of postcodes and associated addresses to generate the actual address.

10 Further memory buttons on the telephone 20 may be programmed with numerical representations of, for example, a person's name, profession, or other data. In a preferred sequence, adjacent buttons are programmed with name, number and postcode respectively. The caller may then have the option of providing all or any of the pieces of information.

15 In practice, when a person using telephone 20 contacts the emergency operator, when he is asked for his location, instead of having to spell out his location with the aforesaid difficulties this involves, he merely presses the relevant one of buttons 23. A tone code representative of the post code is then transmitted over the telephone lines to the operator's telephone system where the relevant postcode data is generated. A printer may optionally be attached to the telephone and this can print the postcode directly or receive input from a suitable database indicative of not only the postcode but the actual address. By using postcode suffixes the individual house number within a postcode group can be identified and by using further suffixes the name of the actual caller, his profession or other details can be retrieved.

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In all aspects of the invention, it is necessary to provide algorithms for the conversion of alpha numeric postcode data to numeric data. Also, telephone memory buttons can generally store upto sixteen numbers. It is
5 therefore preferable that any numeric representation of a postcode be contained within sixteen digits.

In a first algorithm, the alphabetic characters in a postcode are numbered according to their position in the alphabet, ie A-Z corresponds to 1-26. In order to
10 distinguish an alpha character, each alpha character is then followed by a #. Numeric characters retain their number and are normally followed by a star sign. In order to shorten the code, as the final digit in a postcode is always an alpha numeric characters, it is not necessary
15 for the final alpha character to be followed by a #. Finally, any 'AA' group may take the form N#N, NN#N, N#NN or NN#NN. Thus, for NN#NN it is evident that each 'A' is of two digit value, and therefore the middle '#' designator is unnecessary.

20 Using these rules, an example postcode of ZZ1Z1ZZ may be transformed to the 16 digit code 2626#1*26#1*2626 equals 16 digits.

In an alternative algorithm, the following rules are used. Each numeric value takes the form 01 to 09.
25 Each alpha character takes the form 11 to 36. Unused pairs are zero filled. The normal order, using sixteen digits, is outcode (eg ZZ1), incode (eg 1ZZ), delivery point suffix, where the delivery point suffix takes the form 1-5, 0-9 where 0-9 represents A-N (omitting C, I, K and M) and 6-9, 0-9, where 0-9 represents P-Z (omitting O and V).
30

To optimize this further so that fifteen digits can be used, the optimized order would be incode, outcode, delivery point suffix. If only a fifteen digit code is
35 used, then one last digit, 0-9 is available which can specify up to ten individuals in one household.

CLAIMS

1. A method of electronically transmitting data wherein postcode data is transmitted to locate or identify the sender or receiver of the transmitted data.
- 5 2. Apparatus for transmitting and receiving alert messages, comprising means for generating an alert message; means for associating the message with data representative of at least one postcode; means for applying the alert message and said data onto a television or radio signal; and a receiver means comprising means for
10 receiving the television or radio signal; means for comparing the or each postcode data transmitted with a postcode stored at the receiver and means for displaying and/or storing the alert message if a match is found.
- 15 3. Apparatus as claimed in Claim 2, wherein the message and postcode data is transmitted in a non-viewed part of a television signal.
4. Apparatus as claimed in Claim 3, wherein the data is transmitted in the vertical blanking interval.
- 20 5. Apparatus as claimed in any of Claims 2 to 4, wherein data representative of a plurality of postcodes is transmitted.
6. Apparatus as claimed in any of Claims 2 to 5, wherein additional data representative of individual
25 addresses, individual identities and/or criteria relating to individuals is stored at the receiver and transmitted by the transmitting means when appropriate, the alert message being displayed and/or stored only when these match.
- 30 7. Apparatus as claimed in Claim 6, wherein the additional data is representative of a person's profession or hierarchy.
8. Apparatus as claimed in any of Claims 2 to 7, wherein, if in a stand-by mode, the receiver is powered up
35 and the message displayed when a match is found.

9. Apparatus for transmitting information representative of the location and/or identity of a caller; comprising a telephone apparatus; means for storing numerical tone data indicative of at least one of a postcode, the callers identity, the telephone number associated with the apparatus' location and/or an address, and means for generating tone signals representative of the numerical data when a telephone button is pressed and for transmitting these on the telephone line and, means at a receiving telephone systems for receiving the tone signals, converting them into a representation of the postcode, identity, number and/or address and displaying or otherwise indicating this.

10. Apparatus as claimed in Claim 9, wherein the data comprises postcode data.

11. Apparatus as claimed in Claim 9 or Claim 10, wherein the or each piece of data is stored in association with a respective memory button on the telephone set so that depression of a respective button causes transmission of a specific piece of data.

12. Apparatus as claimed in any of Claims 9 to 11, wherein the data is stored in a form to generate tone dialling signals recognisable by a telephone system.

13. Apparatus as claimed in any of Claims 9 to 12, wherein, at the receiving end, the data is processed to obtain an indication of the sender's location and/or identity.

14. Data transmission apparatus substantially as hereinbefore described, with reference to, and as illustrated by, the accompanying drawings.

15. A method of transmitting data, substantially as hereinbefore described, with reference to the accompanying drawings.